Contents

Figures

Boxes

Page left blank for two-sided printing.

Chapter 1 Introduction

About This Chapter

Chapter 1 Introduction outlines the process for preparing *California Water Plan Update 2009: Integrated Water Managements* and its new features. It also explains the organization of all five volumes of Update 2009 and its *Highlights* brochure.

- An Evolving Water Plan
- An Expanded Process
- Inclusive Water Planning
- Expanded Features
- Organization of Water Plan Update 2009

An Evolving Water Plan

The California Water Plan and its updates have been important sources of information for water planners since 1957 (see Box 1-1 Updates of the California Water Plan). As a master plan, it guides the orderly and coordinated control, protection, conservation, development, management, and efficient use of the water resources of the state (Water Code, § 10005(a)).

PLACEHOLDER Box 1-1 Updates of the California Water Plan (Bulletin 160 series)

California Water Plan Update 2005 followed a new direction for statewide water resources planning. It addressed California's changing water management by promoting and supporting integrated regional water management and improved statewide water management systems. Update 2005 charted a Framework for Action as a roadmap to help sustain our water resource use and manage our supplies to ensure that water is available where and when it is needed.

Influences of Update 2005

Update 2005 was the first California Water Plan to explicitly include a strategic plan with a vision, mission, goals, recommendations, and implementation plan. As a strategic plan, the Water Plan should guide us toward meeting statewide and regional water challenges. California Water Plan Update 2009 refines the strategic elements in light of what we, the water community, have learned by following four key process recommendations in Update 2005.

- Expanding the role and participation of other State agencies
- Expanding the role and participation of regional planning efforts
- Engaging communities of interest and communities of place
- Adding a technical advisory group

Update 2009 updates and expands many of the features introduced in Update 2005: a strategic plan with vision, goals, objectives, actions, and recommendations and implementation plan, an analytical approach with extended information and tools, use of water portfolios, regional reports, future scenarios, and resource management strategies.

In preparing Update 2009, the Department of Water Resources (DWR) followed and built on the process developed to prepare Update 2005. It continued to seek participation of California's water communities, responded to new State laws, and refined the framework for planning California's water future.

By statute the California Water Plan cannot mandate actions nor authorize spending for its recommendations. Update 2009 makes neither project-specific nor site-specific recommendations; therefore, it does not include environmental review and documentation as required by the California Environmental Quality Act. **Consequently, policy-makers and lawmakers must take further action to adopt the recommendations and actions in this Water Plan and develop funding methods to help in their implementation.** This underscores the need to have broad public participation and support for the Water Plan in order to have its objectives and recommendations realized.

Fair and Transparent

To create a fair, open, and transparent process, the California State University Sacramento, Center for Collaborative Policy provided impartial third-party facilitation and mediation design, implementation, and refined the consensus-seeking process. The center ensured members of the Steering Committee, Advisory Committee and Tribal communication committee, and participants at regional workshops and forums that their interests, views, and opinions were thoughtfully considered.

The principles of a fair, open, and transparent process will serve as the cornerstone for all future updates because they (1) considerably expand public involvement and access to State government's water planning process; (2) seek collaborative recommendations that are stronger, have greater longevity, and are more likely to be adopted by the Governor's Office, Legislature, State, federal, Tribal, and local agencies and governments, resource managers, and land-use planners; and (3) produce a strategic plan with a vision, mission, goals, guiding principles, recommendations, and an implementation plan with objectives and related actions that are specific and near- and long-term.

An Expanded Process

Update 2005 recognized the vital importance of working with the water community to define issues, identify potential management responses, and evaluate planning steps. The process continued and was expanded for Update 2009 in response to improvements suggested by the Advisory Committee and others at the end of the Update 2005 process. DWR sought the participation of California's water communities, building on the planning framework, lessons, and accomplishments of Update 2005 and following its recommendations (Figure 1-1 Project Organization and Public Process for California Water Plan Update 2009).

PLACEHOLDER Figure 1-1 Project Organization and Public Process for California Water Plan Update 2009

State Agency Steering Committee

For Update 2009, DWR improved interagency coordination to provide a statewide perspective on Water Plan issues by creating the first interagency California Water Plan steering committee. Committee membership represents 21 State government agencies with jurisdictions over different

aspects of state water resources (Box 1-2 State Agencies Represented on California Water Plan Update 2009 Steering Committee). The Steering Committee provided policy input, oversight, program management, and technical assistance in preparing this update. It is at the center of the collaboration circle in which DWR also partnered with federal agencies and Tribal governments and organizations (see Figure 1-1).

PLACEHOLDER: Box 1-2 State Agencies Represented on California Water Plan Update 2009 Steering Committee

Multidisciplinary Project Teams

The core staff responsible for developing Update 2009 comes from multiple disciplines within DWR and partnering State agencies—drawing on a wide range of scientific, technical, and administrative skills. Other interagency staff work teams consist of topic-specific subject matter experts, including their district/regional offices, as well as facilitators.

Work team leads convened as a group on a regular basis to plan and manage work assignments. Regional leads were liaisons from district/regional offices of DWR and State agencies with regional water planning efforts. A facilitation team managed the public process and helped different groups interact.

Advisory Committee

A 45-member Advisory Committee continued to play a vital role helping to define issues, identify potential management responses, and evaluate planning steps. Members of the Advisory Committee were invited from statewide organizations to represent communities of interest including agriculture, water purveyors, business, flood protection, environmental advocacy, Tribes, environmental justice advocacy, planners, cities, counties, and rural communities. A list of Advisory Committee members is included as part of the Water Plan's acknowledgments (see the front section of Volume 1).

Regional Outreach

DWR further refined the Update 2005 process with extensive use of regional workshops and all-region forums to help lay the foundation for regional collaboration and integrated regional water management and planning. The numerous regional workshops informed the Water Plan update about regional water issues and management strategies, and the preparation of regional reports.

DWR convened forums to facilitate implementation of Update 2005 recommendations for regional planning. This required engaging interested parties; identifying information, meeting formats, and exchanges; and finding ways to elevate the diverse needs of regions into statewide

planning. We used several venues to engage regional and local governments and organizations to provide information and policy input to the California Water Plan:

- Annual regional workshops to discuss the Water Plan, share Water Plan staff information needs from the regions, and learn what the regions want from the Water Plan.
- Ongoing conversations in the regions regarding regional reports and activities.
- Annual all-region forums to discuss regional issues that should be considered from a statewide policy perspective. (As an example, water transfers or interregional interactions such as those involving the Delta and Colorado River.)
- Active engagement between regions, the Advisory Committee, and the technical advisory group at the statewide regional and plenary structure.

Federal Government

The Steering Committee sought policy input and information for the Water Plan from federal agencies working with the California Biodiversity Council, the CALFED Agency Coordination Team, and federal-agency panel discussions.

SWAN and Shared Vision Planning

To improve data, analytical tools, and information management and exchange, DWR convened SWAN (the Statewide Water Analysis Network). This technical advisory group leverages the technical skills, professional interests, and scientific knowledge of interdisciplinary scientists and engineers from public, private, and non-governmental sectors. The Climate Change Technical Advisory Group is a subgroup of SWAN.

Technical information and recommendations from SWAN were presented to the Steering Committee and Advisory Committee and at regional and plenary meetings and workshops. This voluntary network reviewed and recommended methods to improve information exchange (see Volume 1, Chapter 6 Integrated Data and Analysis).

Through SWAN, DWR is pursuing the approach and methods of Shared Vision Planning (SVP) in the Water Plan

- to achieve better integration and consistency with other planning activities,
- to obtain consensus on quantitative deliverables,
- to build a common conceptual understanding of the water management system, and
- to improve transparency of Water Plan information.

SVP integrates tried-and-true planning principles, systems modeling, and collaboration into a practical forum for making water resources management decisions. The term Shared Vision Planning is most closely associated with the U.S. Army Corps of Engineers, Institute for Water Resources who have been implementing the approach and methods since the National Drought Study in the 1990s (See www.SharedVisionPlanning.us for additional information).

Plenary Meetings

Plenary meetings were held annually to allow all the forums engaged in the Water Plan to interact and share ideas.

Inclusive Water Planning

Companion State Plans

The Water Plan is a strategic planning document that describes the role of State government and the growing role of California's regions in managing the state's water resources. Update 2009 integrates information and recommendations from companion planning documents of other State agencies, particularly those represented on the Steering Committee. Companion State plans are those plans and programs by State agencies that have a direct connection with the Water Plan. Chapter 3 in this volume shows how these plans were used to develop and augment content in the Water Plan, including its objectives and related actions in Chapter 7 and the resource management strategies in Volume 2.

Climate Change

Climate change is already impacting California's water resources—its snowpack, river flows, and sea levels. The effects of climate change on the State's water resources are reported in Chapter 4 California Today (in this volume). The effects and potential future effects of climate change are part of the uncertainties water managers face as they plan for the future. This Water Plan promotes ways to develop a common approach for data standards and for understanding, evaluating, and improving regional and statewide water management systems. As we do so, the Water Plan's technical teams weigh the challenges of climate change and incorporate them into databases, projections, and technical analysis. Climate change and uncertainty are discussed in Chapter 5 Managing an Uncertain Future and in Volume 4 the Reference Guide. Key actions to improve water resources information and analysis, including integration of climate change studies, are highlighted in Chapter 6 Integrated Data and Analysis.

DWR is taking a leadership role in adapting to effects of climate change on water resources and systems. In October 2008, the department released *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. The strategies of this white paper are part of Update 2009's implementation plan and appear as objectives and related actions (see Chapter 7 The Implementation Plan). The Climate Change Technical Advisory Group contributed to preparation of this white paper.

Integrated Flood Management

Update 2005 recognized that a new approach to flood management was needed to better protect California from the devastating consequences and economic impacts caused by floods and that flood management cannot occur in isolation.

Consistent with the trend toward more integrated forms of water resource management, Update 2009 introduces the concept of integrated flood management, a comprehensive approach to flood management that considers land and water resources at a watershed scale within the context of integrated regional water management and aims to maximize the benefits of floodplains,

minimize the loss of life and damage to property from flooding, and recognize the benefits to ecosystems from periodic flooding. Integrated flood management does not rely on a single approach to flood management, but instead utilizes various techniques, including traditional (or structural) flood protection projects, non-structural measures (such as land use practices), reliance on natural watershed functions, and the flood management benefits that can result from other forms of water resource management to create an integrated flood management system.

Integrated flood management is discussed in Chapter 2; related management strategies are in Volume 2.

Water Quality

Water is more then just wet. Beyond the abundance and distribution of water to meet the needs in California the quality of water can have a significant impact on the management of water. Recommendation 3 of Update 2005 stated, "State government must lead an effort with local agencies and governments to remediate the causes and effects of contaminants on surface water and groundwater quality."

The preparation Update 2009 involved the coordinated efforts of numerous State agencies and stakeholders in order to take notice of actions currently being taken, identify the issues, and make recommendations to protect and improve water quality methods and strategies that will safeguard public and environmental health while maximizing the uses of water. This coordinated effort will continue to provide solutions to the current and future issues surrounding water quality.

California Native American Tribes

As with Update 2005, representatives of Tribal water interests sat as members of the Update 2009 Advisory Committee. The Native American Heritage Commission sat as a member of the newly formed State Agency Steering Committee. DWR's expanded outreach also included Tribal plenary meetings and increased Tribal participation in regional workshops through pre-workshop gatherings for Tribes. To improve Tribal involvement, DWR sought procedures designed by the Tribes, Tribal communities, and Tribal organizations. This helped DWR, the facilitation team, and the steering committee organize, design, and deliver tribal regional input into Update 2009.

A Tribal Communication Committee was formed. TCC members represent only themselves, not their Tribes, at the meetings. The goal of the TCC was to develop a Tribal Communication Plan for involving and getting input from California's Tribes. The communication plan has become a foundational document to help guide Update 2009 and future Water Plan updates. (The plan is presented in Volume 4 Reference Guide.)

Expanded Features

California Water Plan Update 2005 introduced a Framework for Action to help us sustain our water resource use and manage our supplies to ensure that water is available where and when it is needed. It recommended the use of multiple scenarios to consider a variety of plausible futures. With scenarios, water planners and managers can test the implementation of regionally specific response packages—multiple resource management strategies—and reduce the risk and uncertainty of future water planning, management, and supplies. Other features of Update 2005 included an analytical approach with extended information and tools, use of water portfolios, and regional reports.

Following are some significant accomplishments of California Water Plan Update 2009 that provide California's water leaders with useful tools and should continue to be the cornerstone for water plan updates.

Assumptions and Estimates Brochure and Data

The California Water Code requires that an Assumptions and Estimates Report be published one year before the California Water Plan Update is released. The A&E Report describes the most significant data and data sources that will be used to prepare the update. For Update 2009, DWR produced a brochure as part of the A&E Report. The brochure explains how the quantified deliverables—water portfolios, future scenarios, and response packages—would help develop or influence seven of the eight activities for Update 2009 (Box 1-3 Eight Activities for Update 2009). A draft A&E Report was released in January 2007, one year before the release of the public review draft of Update 2009.

PLACEHOLDER Box 1-3 Eight Activities for Update 2009

Future Scenarios

To acknowledge that California's water communities do not know with certainty what will happen in the future, this Water Plan update presents three plausible yet very different baseline scenarios for 2050, rather than a single "likely future." Each scenario describes a different baseline for 2050, to which the water community would need to respond by implementing a mix of management strategies. The scenarios are created by varying assumptions about important factors that affect water use and supplies, but the water community has little control regarding population growth, development patterns, crop markets, industrial productivity, and environmental regulations. The three baseline scenarios developed for Update 2009 are named Current Trends, Blueprint Growth, and Expansive Growth.

Regional Reports

In compliance with SB 672 (Stats. 2001, ch. 320), a regional report has been prepared for each of the 10 hydrologic regions, as well as the Sacramento-San Joaquin River Delta, and the Mountain Counties overlay area (Figure 1-2 Hydrologic regions with Sacramento-San Joaquin Delta and Suisun Marsh and Mountain Counties Area.). Each report includes the region's major challenges, current programs and projects, future outlook, and water portfolio.

PLACEHOLDER Figure 1-2 Hydrologic regions with Sacramento-San Joaquin Delta and Suisun Marsh and Mountain Counties Area

For Update 2009, DWR expanded the regional reports to include additional information and regional issues:

- summary of surface water quality
- regional floods and flood management
- strategies identified in current Integrated Regional Water Management efforts
- projected future water demands to the year 2050 for three alternative scenarios.

These regional reports also have added information about Tribal populations in each region, the water resources they use, and a brief summary of some unique Tribal water issues.

Resource Management Strategies

Update 2009 describes a broad and diverse set of 27 resource management strategies, more than in Update 2005. This Water Plan includes updates for all management strategies in Update 2005 Volume 2 and several new strategies on salt and salinity management, forest management, flood risk management, as well as a strategy on Delta conveyance.

The resource management strategies strengthen integrated regional water management. They can help regions meet future demands and sustain the environment, resources, and economy, involve communities in decision-making, and meet various goals. A resource management strategy is a project, program, or policy that helps local agencies and governments manage their water and related resources (see Volume 2 Resource Management Strategies). These strategies can reduce water demand, improve operational efficiency, increase water supply, improve water quality, practice resource stewardship, and improve flood management. For example, urban water use efficiency is a strategy to reduce water demand. A pricing policy or incentive for customers to reduce water use can help practice resource stewardship. Conjunctive management and groundwater storage can increase water supply. Urban runoff management can improve water quality. But each strategy can have multiple potential benefits. (See Box 1-4 Potential Resource Management Strategy Benefits.)

Each region needs to choose an appropriate mix of strategies based on its own water challenges and management objectives and goals.

PLACEHOLDER Box 1-4 Potential Resource Management Strategy Benefits

To implement these new features, DWR has made—and we, the water community, need to make—significant analytical changes as summarized in Box 1-5 Analytical Changes and described in Chapter 6 Integrated Data and Analysis.

PLACEHOLDER Box 1-5 Analytical Changes

Quantification of Scenarios and Management Responses

Update 2005 introduced several new concepts within the analytical approach for evaluating statewide and regional water conditions (as compared to previous updates). These new concepts help define the long-term direction for the update process. Update 2009 has built upon Update 2005 by including additional years in the Water Portfolios, refining the representation of future scenarios, and more fully describing water management response packages. Chapter 5 describes the basics behind the development of scenarios for Update 2009 and some of the statewide drivers, and presents three narrative scenarios for conditions through 2050. Chapter 6 describes the underlying methods for quantifying scenarios, the factors of uncertainty that can drive future water demand and available supply, and a work plan to improve the water plan's data and analytical methods and tools.

The key factors of uncertainty affecting future water demand are future land use patterns, future population and other demographic patterns, and future climate. Future land use patterns affect how much land is devoted to irrigation for agriculture or landscaping. Higher density urban development or water-wise landscaping practices can result in less water applied to landscape irrigation. Future population growth also has a significant affect on future water requirements. Future climate including occurrence of drought and wet years will affect the availability of supply and the additional water required to grow crops and maintain plants used in landscaping.

Progress toward Implementing Update 2005 Recommendations

Progress continued to be monitored through 2009

Recommendation 1 – Diversify Regional Water Portfolios

- Grant award from Proposition 50 The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002
- Proposition 84 Water Quality, Safety and Supply. Flood Control. Natural Resource Protection (2006)
- Prop 1E Disaster Preparedness and Flood Prevention (2006)
- SBX2 1 Water Bill (2008) authorized grant funding for Integrated Regional Water Management—Propositions 84 and Prop 1E
- State's Drought Water Bank reactivated

Recommendation 2 – Promote and Practice Integrated Regional Water Management

- Grant award from Proposition 50 The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002
- SBX2 1 Water Bill (2008) authorized grant funding for Integrated Regional Water Management—Propositions 84 and Prop 1E
- Water Board Basin Plan updates
- Bay Delta Conservation Plan process (started 2007)
- Proposition 84 Water Quality, Safety and Supply. Flood Control. Natural Resource Protection (2006)

Recommendation 3 – Remediate Surface Water and Groundwater Contaminants

- Grant award from Proposition 50 The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002

Recommendation 5 – Implement the CALFED Program

- Delta Vision Blue Ribbon Task Force Vision Plan (2007)
- Delta Vision Blue Ribbon Task Force Strategic Plan (2008)
- Delta Vision Implementation Report (2008)
- Delta Risk Management Strategy (DRMS)
- Departments of Water Resources and Fish and Game report: Risks and Options to Reduce Risks to Fishery and Water Supply Uses of the Sacramento/San Joaquin Delta (2008)

Recommendation 6 – Provide Effective State Government Leadership, Assistance, and Oversight

- Water Plan State Agency Steering Committee
- Water Plan regional outreach
- Water Plan e-News
- Integrated Water Resources Information System
- 20x2020 (20 percent reduction in per capita urban water use statewide by 2020)

Recommendation 7 – Clarify State, Federal, and Local Role and Responsibilities

- Water Plan State Agency Steering Committee
- Reorganize DWR's Division of Planning and Local Assistance and Office of Water Use Efficiency and Transfers to more effectively implement integrated water management responsibilities.
- Delta Vision Blue Ribbon Task Force Strategic Plan

Recommendation 8 – Develop Funding Strategies and Clarify Role of Public Investments

- Proposition 84 Water Quality, Safety and Supply. Flood Control. Natural Resource Protection (2006)
- Prop 1E Disaster Preparedness and Flood Prevention (2006)
- FloodSAFE

Recommendation 10 – Adapt for Global Climate Change Impacts

- Global Warming Solutions Act of 2006 (AB 32): California Air Resources Board Scoping Plan to achieve reductions in greenhouse gas emissions
- Governor's Climate Summit
- Climate Action Team
- DWR's Managing An Uncertain Future: Climate Change Adaptation Strategies for California's Water
- California Climate Change Web portal: http://www.climatechange.ca.gov/
- California Energy Commission Public Interest Energy Research (PIER) Program
- California Climate Change Center Biennial Science Reports

Recommendation 11 – Improve Water Data Management and Scientific Understanding

- Statewide Water Analysis Network (SWAN), a standing technical advisory group

Recommendation 13 – Increase Tribal Participation and Access to Funding

- Water Plan Tribal Communications Committee (TCC)
- TCC Tribal Communications Plan
- Tribal Water Summit (2009)
- DWR Tribal Liaison

Organization of California Water Plan Update 2009

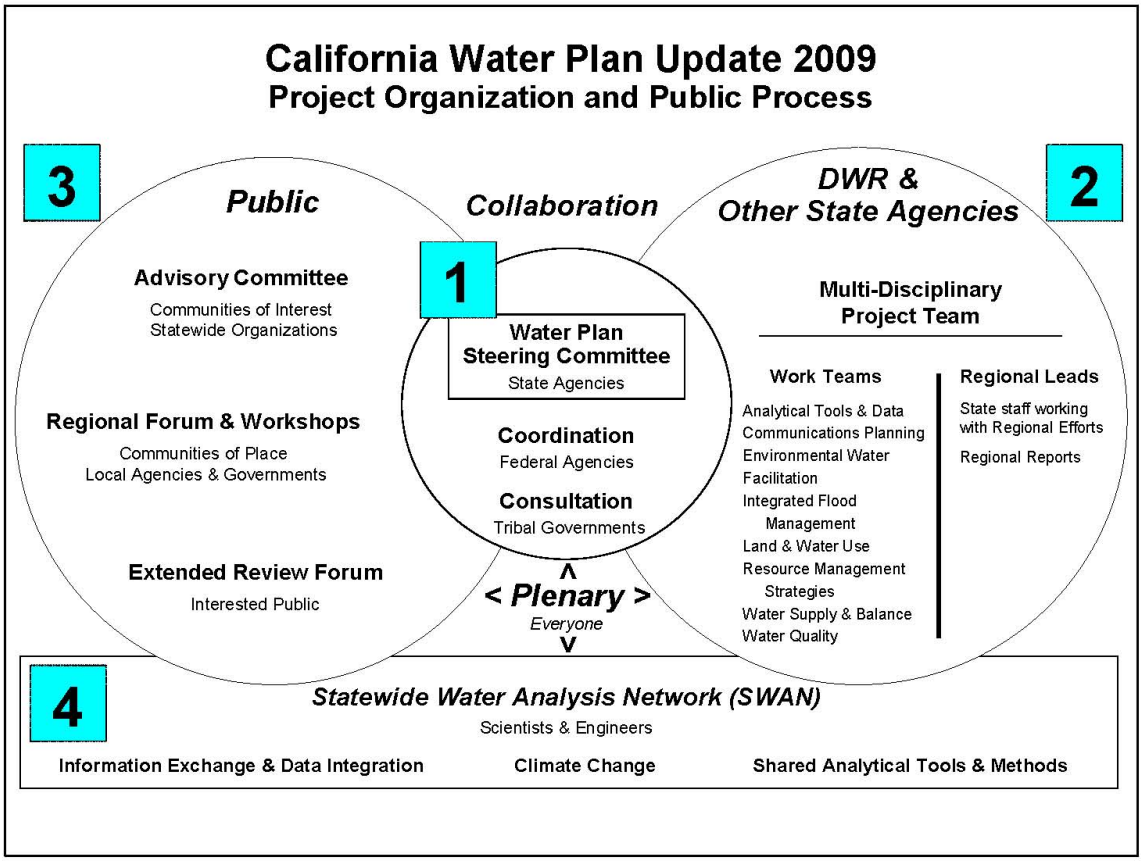
Volume 1 Strategic Plan

Volume 2 Resource Management Strategies

Volume 3 Regional Reports

Volume 4 Reference Guide (online only)

Volume 5 Technical Guide (online only)



Circle (1) Collaboration

Circle (2) California Department of Water Resources and Other State Agencies

Circle (3) Public

Box (4) Statewide Water Analysis Network (SWAN)

Figure 1-1 Project Organization and Public Process of California Water Plan Update 2009

The project organization and public process design for preparing the Update 2009 builds on the planning framework, lessons, and accomplishments of Water Plan Update 2005. This diagram illustrates the process components. Three overlapping circles depict the participants, relationships, and information exchange between and among the participants, namely government agencies, Tribal governments, and statewide, regional, and local stakeholders. The box beneath the circles represents the technical experts, information, and science supporting the update. Plenary meetings tie them all together.

Box 1-1 Updates of the California Water Plan (Bulletin 160 series)

The California Water Plan is the State's strategic plan for managing and developing water resources statewide. Since its first California Water Plan, published as Bulletin No. 3 in 1957, the Department of Water Resources has prepared seven water plan updates, known as the Bulletin 160 series. The California Water Code now requires the water plan to be updated every five years. For fuller descriptions, see Volume 4 Reference Guide article "A Look Back at Past California Water Plans."

Bulletin No. 3 described a comprehensive master plan for the control, protection, conservation, distribution, and use of the waters of California to meet present and future needs for all beneficial uses in all areas of the state to the maximum feasible extent. The plan was intended to indicate the general manner in which California's water resources should be developed to satisfy its potential ultimate water requirements with emphasis on statewide water projects.

Statewide planning studies to update the California Water Plan have continued since 1961. Each update took a distinct approach to water resources planning, reflecting issues or concerns at the time of its publication.

Implementation of the California Water Plan (1966). The first of the Bulletin 160 series, Bulletin 160-66, proposed a pattern for implementation of specific parts of the California Water Plan as set forth by the California Water Code. Water policy concerns included flood control and floodplain management, power demands, water-related recreation, the relationship of fish and wildlife to water development, and water quality.

Water for California: The California Water Plan; Outlook in 1970. By 1967 the growth rate of California's population had slowed from that of the 1950s; population projections for 1990 and 2020 were reduced. Irrigated acreage estimates were also reduced, and more accurate information on the consumptive use of crops and the extent of water reuse was available. With projects then under construction or authorized, the report concluded that sufficient water supplies would be available to meet most of the 1990 require ments. The trend toward increasing environmental awareness was noted at both the national and state levels.

The California Water Plan: Outlook in 1974. This report concluded that the status of available supplies was favorable based on the premise that the Auburn, New Melones, and Warm Springs reservoirs and the Peripheral Canal would be operational by 1980. The report was less conclusive about the extent to which supplies would satisfy future needs, considering new California legislation for wild and scenic rivers. The update included a detailed section on water quality control (or basin) planning written by staff at the State Water Resources Control Board as well as water demand estimates for alternative futures for California population growth and agricultural acreage. Key water policy issues were cooling water for electric energy production, water deficiencies (risk), water exchanges, public interest in agricultural drainage (San Joaquin Drain), water use efficiency (water conservation), economic efficiency (water transfers), and wastewater reclamation.

The California Water Plan: Projected Use and Available Water Supplies to 2010 (1983). More of a technical report than were previous editions, this water plan included agricultural models applied for the first time. These were used in assessing the general economic effects of increasing water and energy costs. The report quantified the effect of urban and agricultural water conservation measures and the potential for water reclamation as a means of reducing additional

water supply needs. Included in the update was a detailed statewide waterflow diagram titled Hydrologic Balance Network for California 1980.

California Water: Looking to the Future (1987). Bulletin 160-87 took a broad view of water events and issues in California. The report also discussed several leading water management concerns including water quality, the Sacramento-San Joaquin Delta, and a wide range of evolving water policies. One of its main conclusions was that in roughly three out of four years, California's water resources, including rights to the Colorado River, were sufficient to meet all of its water needs for the foreseeable future.

California Water Plan Update: Bulletin 160-93 (1994). This report discussed how population growth, land use, and water allocations for the environment were affecting water resource management. It differed from the five previous water plan updates by (1) estimating environmental water needs separately and accounting for these needs along with urban and agricultural water demands, (2) presenting water demand management methods as additional means of meeting water needs, and (3) presenting separate water balance scenarios for average and drought conditions. This was the first Bulletin 160 update to incorporate an advisory committee of representatives of interested parties.

The California Water Plan Update: Bulletin 160-98 (1998). The 1998 update evaluated water management options that could improve California's water supply reliability. Water management options being planned by local agencies were used as the building blocks to evaluate future water conditions for each of the state's 10 hydrologic regions. Potential local options were integrated with options of a statewide scope to create a statewide evaluation.

The California Water Plan Update 2005: A Framework for Action (2005). The first update of the 21st century, A Framework for Action represented a fundamental shift in how people look at water resources management. It recognized the need to work cooperatively and to approach water management in a comprehensive, integrated way. It was the product of a collaborative process that brought together the Department of Water Resources with an advisory committee representing urban, agricultural, and environmental interests. For the first time, the state's water plan included a strategic plan, including actions for meeting the challenges of sustainable water uses and reliable water supplies in the face of an uncertain future.

Box 1-2 State Agencies Represented on California Water Plan Update 2009 Steering Committee

The Water Plan Steering Committee—composed of the following State agencies, departments, boards, and commissions—provide policy input, oversight, and program management. Committee members have sufficient authority to represent their agencies and allocate staff and resources to Water Plan activities as appropriate. As the committee chair, DWR is responsible for providing administrative and logistical support and for completing Water Plan Updates as required by Water Code (§10004 -- §10013).

1. Department of Boating and Waterways
2. Business Transportation and Housing Agency
3. California Environmental Protection Agency
4. CALFED Bay-Delta Program
5. California Energy Commission
6. California Public Utilities Commission
7. Department of Conservation
8. Department of Fish & Game
9. Department of Food and Agriculture
10. Department of Forestry and Fire Protection (CAL FIRE)
11. Department of Housing and Community Development
12. Department of Pesticide Regulation
13. Department of Public Health
14. Native American Heritage Commission
15. Department of Parks and Recreation
16. Department of Transportation
17. Governor's Office of Planning and Research
18. Governor's Office of Emergency Services
19. State Lands Commission
20. State Water Resources Control Board
21. Department of Water Resources

Box 1-3 Eight Activities for Update 2009

1. Strategic Plan

Review and revise the Water Plan vision, mission, goals, and principles; and update its initiatives, recommendations, and implementation plan. This includes (a) reporting progress on actions associated with Update 2005's 14 recommendations, (b) addressing "Parking Lot" topics from the Update 2005 Advisory Committee, (c) incorporating issues and initiatives from steering committee members, (d) updating the Water Plan stakeholder/customer survey, and (e) including strategic planning for statewide flood management.

2. Scenarios

Develop multiple scenarios of future California water conditions, and use scenarios to evaluate different combinations of resource management strategies (called response packages) for a range of water demand and supply assumptions plus climate change.

3. Climate Change

Incorporate climate change in Water Plan scenarios to evaluate impacts on California's water resources and water systems, and to identify and recommend statewide and regional adaptation strategies.

4. Regional Reports

Update the Regional Reports for the 10 Hydrologic Regions and for the Sacramento-San Joaquin Delta and Mountain Counties as areas of special concern. Use information from the Integrated Regional Water Management and local water and flood planning efforts to describe critical issues, key initiatives, effectiveness of regional planning efforts, and region-specific response strategies.

5. Management Strategies and Response Packages

Update the 25 Resource Management Strategies with current research and information. Expand strategy narratives to describe their suitability for integrated flood management and their current and future implementation in various regions.

6. Water Portfolios

Estimate and present actual water uses, supplies, and quality (Water Portfolios) for water years 1998 through 2005. Improve methods for representing consumptive and nonconsumptive environmental water, and where reuse of water is occurring.

7. Analytical Tools

Improve information exchange and data integration, data, and analytical tools to inform all Water Plan activities and decisions and to assist California water planners and managers.

8. Companion State Plans

Incorporate findings and recommendations from companion State government plans.

Box 1-4 Potential Resource Management Strategy Benefits

Several of the goals and recommendations of this Water Plan relate to the benefits described here. Each resource management strategy described in Volume 2 tells of its potential benefits. They also are noted in the summary table in Volume 2 Chapter 1 Introduction.

Provide water supply benefits. Reduce water demands, improve operational efficiency, redistribute water, and/or augment water supplies.

Improve drought preparedness. Reduce the economic, environmental, and social impacts of drought on regions including activities that increase water conservation, reduce dry year demand, increase surface water or groundwater storage, allow short-term transfers of surplus water, or increase reuse of water.

Improve water quality (all use sectors). Improve water quality by matching water quality to its use or by using treatment technology. Other water management strategies, such as storage, conveyance, and water use efficiency, may also benefit water quality. Water quality is also improved by preventing or reducing pollution, agricultural drainage, and urban runoff.

Improve system flexibility and efficiency. Link and operate water management facilities in a way that increases beneficial use and reuse of water overall. For example, additional interconnection among neighboring water districts can help short-term water transfers during dry years and reduce the impacts of drought.

Reduce flood impacts. Reduce flood damage to life and property by minimizing flow impacts to developed land, maintaining or restoring natural floodplain processes, removing obstacles within the floodplain voluntarily or with compensation, educating the public about avoiding flood risks and planning for emergencies, developing policies for appropriate land use in undeveloped floodplains.

Provide environmental benefits. Protect, restore, or enhance watersheds and ecosystems. This may include instream flow and timing changes, temperature management, habitat restoration, physical modification to water bodies, reduction of diversion impacts to fisheries (for example, fish screens), control of waste discharge in waterways, exotic species control, removal of barriers to anadromous fish migration, land and water acquisitions, managed wetlands, and fire management.

Increase energy generation or reduce use. Generate additional energy supplies or reduce energy consumption.

Increase recreational opportunities. Provide or enhance recreational opportunities in freshwater bodies, such as lakes, reservoirs, and rivers, and outdoor recreation activities near water, such as wildlife viewing, picnicking, camping, and hiking.

Reduce groundwater overdraft. Reduce the condition in which over the long term the amount of groundwater withdrawn by pumping exceeds the amount of water that recharges the basin. Groundwater overdraft is characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years.